

AMERICAN VETERINARY REVIEW,

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ORIGINAL ARTICLES.

THE HORSE'S FOOT.

BY A. ZUNDEL.

(Continued from page 270.)

LAMINITIS.

II. *Termination and Complications.*—Well treated, laminitis is generally of short duration, and ends in three or four days by *resolution*. Sometimes, however, this is not accomplished until a later period, even towards the tenth day, though cases of this character are rare; and even when resolution proceeds slowly, some lesions in the foot may be looked for, and chronic laminitis will probably result. Resolution in acute founder is marked by the gradual disappearance of the local and general symptoms. In some subjects, the improvement is quite rapid from day to day, and the form of termination is known as *delitescency*. Laminitis ending in resolution is not usually followed by alterations in the horny box or the tissues which it covers.

When the congestion which constitutes the disease terminates otherwise than by resolution, it is always followed by accidents of varying character. Some of these may have a happy termination, but in the end are more or less likely to be followed by a deformity of the horny box, to which the name of *chronic laminitis* is given. Before entering upon this, however, let us examine the various complications which may follow acute founder,

and study in succession: the *hemorrhage, inflammation with exudation, suppuration, gangrene, consecutive arthritis, metastasis*, and lastly *chronic laminitis*. Resolution is most commonly met with in the ox. Sometimes the separation of the hoof by suppuration occurs, and chronic founder is not observed in that animal. It is seldom that seedy toe is observed.

a.—Hemorrhage, or apoplexy of the reticular tissue, is due to the rupture of the excessively distended capillaries, when the extravasated blood either infiltrates into the meshes of congested tissue, or spreads around it, and penetrates between the podophyllous and keraphyllous lamellæ, filling up the spaces at the toe, the mammæ and the anterior parts of the quarters, the os pedis being pushed back by the pressure of the incompressible fluid. The pain is then very great; the blood continuing to separate the tissues, often oozes at the coronary band.

If this last sign is absent, a groove may be made with a drawing-knife in the region of the toe, behind the commissure of the sole and of the wall. If we meet with a cavity, resulting from the extravasation of the blood in the podophyllous and keraphyllous space, or if blood flows out from it, the true nature of the complication becomes at once apparent. This mode of exploration is generally difficult, as the animal in pain does not readily allow his feet to be raised, and, as the other foot cannot sustain the entire weight of the body, the horse easily falls down. It is sometimes necessary to throw the animal, in order to make this exploration, which very often becomes necessary if we would know accurately the progress of the disease.

b.—Inflammation, with fibrinous exudation, or pseudo-membranous formation on the surface of the podophyllous tissue. The transudated fibrine mixes with the hoof, secreted by the podophyllous tissue, and this matter separates that structure from the keraphyllous laminae, especially at the anterior part of the region. Again, in chronic laminitis we find this abnormal secretion pushing the os pedis forcibly backwards and separating the toe of the bone from that of the hoof, and thus producing a pain still greater and more violent than that produced by the laminitis and the hemorrhage. These pains are often so intense

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that they give rise to an access of furious vertigo. But pains, even when of an exaggerated degree, indicate simply the presence of the exudative form of laminitis. It is not a positive sign; the foot must be explored at the toe, where, in the vacuum which exists between the horny lamellæ is found, more or less abundantly, a citrine serosity of a slightly reddish color. Sometimes this serosity oozes between the hair and the hoof, in consequence of the separation of the tissues at the coronary band, and appears in the form of a thin, reddish foam, about the band itself.

c.—Suppuration between the wall and the podophyllous tissue is a complication more rare than the others, but which, however, has been observed, especially when laminitis is traumatic. We have seen it appear under the sole and separate it entirely from the tissues underneath. In these cases, the pain is always very great, and the living structures are pressed beyond measure. Standing is impossible, and the animal continues lying down, or, under the influence of the pains, constantly moving from one leg to another, balancing himself, so to speak. There is no relief for him until the suppuration has shown itself between hair and hoof, when it oozes outward at the coronet. Relief, however, may also be obtained by making an opening at the toe with the drawing-knife. This complication often results in the entire separation and dropping off of the hoof. Cases have been observed when this accident has taken place as early as the third day (Lafosse, Stanley.) Gillmeyer has seen a new foot grow out entirely, but this requires a long time.

d.—Gangrene of the sub-horny tissues sometimes takes place, though seldom, under the influence of the excessive pressure, especially when there is sub-horny exudation. The violent pains then cease suddenly; the resting becomes more solid; the movements take place without difficulty. But at the same time, the physiognomy of the patient becomes anxious and contracted; the pulse becomes small and difficult to count; the temperature of the body diminishes; the animal has a trembling gait; is indifferent to any excitement; he is prostrated, and soon he ends by septicæmia. The hoof then often drops off, and the sub-horny tis-

sues are seen to be of a bluish-brown color, without consistency, but with a very foetid odor.

Volpi thought that laminitis was the inflammation of the articulation of the foot; but this *arthritis*, if it exists (a fact which is rare), is not a consecutive phenomenon, but a complication. The inflammation does not remain limited to the reticular tissue; it extends also, and consecutively, to the contiguous structure, spreads to the tendons and articular ligaments, even penetrates to the synovial capsules of the articulation of the third with the second phalanges, and may also react upon other parts of the organism. The ankylosis of the articulation of the foot with that of the coronary joint are complications somewhat frequent, as well as that of the ossification of the cartilages of the foot.

f.—Metastases have been often observed, and when accompanied by intense fever have been noticed as complicated with serious diseases of the chest, especially of pleuro-pneumonia. At other times it has been the intestines to which the metastasis has transferred the disease, in which case there is, in most instances, constipation of the bowels. Enteritis, however, is seldom observed, notwithstanding what has been said on the subject. This metastasis has also been seen toward the lumbar region, and this is much more commonly believed from the fact that there is more motion at the hip than at any other joint during locomotion, and also because the back and the loins are more or less arched. In fact, laminitis has been by some designated as an affection of the loins; some have looked upon it as a rheumatism of that region. All these errors have originated in the peculiar motion of the animal while walking, or of its peculiar mode of resting when standing still. We have also observed an attack of complete myelitis as a complication of laminitis.

*g.—*The most common complication met with in *chronic laminitis* is an affection which we might have treated as a special subject had we not, upon principle, considered it as a sub-inflammatory state of acute founder of the foot. An attack of laminitis which has not ended by resolution in five, ten, or fifteen days at

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most, takes a character of persistency which, in most cases, ends in absolute incurability. To properly study chronic laminitis we must observe it when the alterations which characterize it are accomplished. When we have completed the consideration of the pathological changes we will examine the intermediate period, and discuss the mechanism by which these alterations take place in relation to the pathological anatomy.

The first thing observed is the change of form in the hoof. The nail of a horse's foot easily recalls the form of a Chinese shoe. (Knollhuf of Germany.) The hoof seems to have lost its varnish and its suppleness in the points corresponding to the diseased parts. It is, besides, brittle, and seems to have lost part of its connection with the remaining parts of the foot, and there is a change in the direction of the wall, the fibres of which, instead of being oblique to the ground, assume an almost horizontal direction. The foot seems as if flattened from above downwards, and the lines which bound its surface form a well-marked obtuse angle with that of the coronary region. The anterior wall of the foot also forms a well-marked projection forward, from which results a great exaggeration of the antero-posterior diameter of the nail with the transverse diameter and the oval form of the horny box. The external surface of the wall, instead of being smooth, as in physiological conditions, presents, on the contrary, a roughened appearance, which results from the presence of circles of ridges and circular grooves, placed one above the other and extending from one heel to the other. A remarkable peculiarity is here observed in the fact that in the anterior part of the nail the circles are quite near each other, while, on the contrary, upon the lateral parts they are separated by much wider grooves. When, then, at the toe, the wall has some difficulty in growing downwards, on account, probably, of the internal adhesions between the podophyllous and keraphyllous tissues; the heels, on the contrary, grow without difficulty, and thus obtain a relative height superior, and sometimes even equal, to that of the toe. Often at the mammæ and quarters of the foot contractions are seen, and longitudinal grooves running from the coronary band to the plantar surface, reminding one of the lesions met with in encastelure.

Considered on the side of the inferior face the old foundered hoof offers four remarkable lesions. Besides its oval form, a disposition altogether different from that of the normal state, the sole is convex in all the anterior part of the plantar region, especially at the point of the frog. There exists at that point a transversal tumor or enlargement, projecting sufficiently to exceed in height the inferior border of the wall. The solar sheet has been pushed outward by the pressure against the superior face from the contents of the horny box, and the foot is convex. This convexity never equals the entire extent of the foot, the deformity ending at the boundary of the inferior border of the bars, beyond which and backwards are found the cavities of the lateral lacunæ of the frog, so much more elevated as the heels are also higher. The centre of this tumor or enlargement of the sole is often flexible under the pressure of the finger, and generally bleeds easily on the application of the sharp tools of the blacksmith. It is not rare to see the sole perforated through and through and showing the inferior border of the os pedis projecting through the border of the bone, which then soon becomes necrosed. This is the result of the excessive displacement of the os pedis and of the strong pressure upon the velvety tissue against the sole-tissue, which is atrophied or even destroyed. This is an ulcerating wound, somewhat semi-lunar, secreting a very offensive pus, with granulation and some proud flesh, or even separation of the sole.

Between the sole and the wall the line of demarcation is no longer so well defined as in the normal state. At the toe, the mammæ and the anterior part of the quarter, there is an excavation formed of softer horn of bad nature and less identified with the true horn of the wall and of the sole. A complete vacuity is often found, a cavity around the internal face of the wall at the toe and at the mammæ of varying depth and size, but always larger at the inferior than at the superior end of the foot, where it gradually diminishes, and often contains a dry, granular mass, resulting from the drying of the blood, and the dried plastic lymph, mixed with small, horny, pulverized masses. This cavity is formed in front by the healthy wall and posteriorly by a new wall due to the secreted hoof thrown upon the podophyllous

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tissue; this is called *seedy toe*. This double wall is observed especially after laminitis of the hind feet; it is more common in the donkey and the mule; it is also noticed in horses with small feet, as in those of Oriental breeds.

The deformities of the horny box due to chronic laminitis are not in all cases identical in their character; there are degrees in them, and consequently they vary in their features, which variations are due to the duration of the disease and its intensity, and also, according to H. Bouly, to the primitive form of the diseased foot. In a case of chronic founder of the forefeet one may often notice a difference between the deformity of the left and that of the right foot. The deformities may take place at various times, and one may find a well-marked case of seedy toe while as yet the wall has preserved its normal oblique direction and shown only rudimentary ramy appearances. Again, the wall may have undergone changes in its direction only at the new hoof, which grows from the coronary band; there is then formed between the old wall and the coronet a circular groove, sometimes called the *digital cavity*, the deformities of the wall taking place only as it grows down. At times, also, instead of the groove, there is a ridge of horn at the coronary band, originating in the hyper-secretion of the horn, which grows also downward. And, again, there are cases where there is seedy toe and still no well-marked alteration of the shape of the wall of the sole.

Chronic laminitis is always accompanied with more or less lameness. There are cases, however, where it is missing; for example, in seedy toe. Ordinarily the foot is raised from the ground with a convulsive motion, as may be well observed in donkeys and mules, which animals rest their feet on the heels. This soreness diminishes with time, as the foot, assuming its new form, offers a wider space to the sub-ungulated tissues and presses less upon them, these tissues having at the same time become somewhat atrophied. In cases of hernia of the os pedis the resting of the foot on the ground is almost impossible, the animal being afraid to bear his weight on the sole. The heat and the pain of the feet are less marked. The percussion is louder in

case of seedy toe, while it is duller when the space between the wall and the reticular structure is filled with hoof of new formation. This percussion is very painful in case of keraphylocele. Unless there are serious lesions, chronic laminitis is not accompanied with fever.

(*To be continued.*)

AN INQUIRY

INTO THE ETIOLOGY AND PATHOLOGY OF THE VENEREAL DISEASES OF MAN AND OF THE LOWER ANIMALS.

BY CHARLES F. RING, M.D.

(*Continued from page 282.*)

THE NEW VENEREAL DISEASE OF SOLIPEDS.

This brings us to a consideration of the last division and closing argument of our study, without which our investigation would not be complete, viz.: To an inquiry into the nature of the new venereal disease of solipeds, and its relation to human syphilis, and hence to glanders.

"For a long time before the communicability of glanders to man was recognized," writes Bollinger, "the disease had acquired a certain interest, as regards its bearing upon human pathology, from the circumstance that Van Helmont (1682) sought to refer to it the origin of syphilis, a theory adopted at a later date by Ricord. The source of this erroneous idea has been traced by Virchow to the report—at one time accepted as true—that glanders first appeared, together with syphilis, at the siege of Naples, towards the end of the fifteenth century. More recent observations have since demonstrated that the virus of syphilis, when introduced into horses, never produces glanders; and it is still more significant that syphilis, as such, is never known to occur in domestic animals." (*Ibid.*, article Glanders.)

It is rather surprising that a veterinary professor and author should make an assertion like this, in the face of so much testimony of an opposite character. He certainly cannot be unacquainted with the new venereal disease of solipeds, to which

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Professor Fleming allots so much space—36 pages—in his *Manual of Veterinary Sanitary Science and Police*.

Professor Law, in a much smaller work (*Farmer's Veterinary Adviser*, p. 46), speaks of a serious constitutional disease of a venereal nature existing "in the horses of Arabia, North Africa and Central Europe, bearing a strong resemblance in many points to syphilis," and of a comparatively recent origin.

Professor William Williams treats of this new disease of the horse under the title of "*Maladie du Cit*," and says, "It was first seen in Russia in 1796, and that it has since invaded Africa, Egypt, and the majority of the European countries. No mention, however, has been made of it in Great Britain, Spain, or Belgium." (*Veterinary Surgery*, second edition, Vol. I, p. 249.)

The statement of Bollinger, "that the virus of syphilis, when introduced into horses, never produced glanders," is, in weight of argument, about as insufficient as would be the assertion that, as the poison of syphilis never produced a disease like the epidemic, it hence never could have been derived from it.

But we shall see how far, even in this apparently secure position, Bollinger is likely to be sustained by the evidence in the case.

Fleming gives a very comprehensive account of the geographical distribution and history of this new disease, only a small portion of which we have room here to quote. He says: "This is a malady which has only come into notice within a comparatively recent date, and we cannot do better, in attempting to define its geographical limits, than give a brief sketch of its history. The first notice of the disease is that given by the German veterinarian, Ammon, in 1796 and in 1799; he observed it in the district of Trakehnen, North Prussia, affecting mares and stallions. It persisted in this locality until 1801, when Count Lindenau, Master of the Horse to the King of Prussia, caused it to be carefully studied by Reckleben; and two years afterwards (1803) Ammon and Dickhauser gave an excellent description in *Tenneker's Gazette* (Vol. III). From 1801 the malady disappeared from Prussia, but extended northward, causing much loss in Lithuania, and returning again to Trakehnen in 1807, where it once more came under the cognizance of Ammon.

General Daumas, author of the "Chevaux du Sahara," alludes to the frequency and ravages of the disease among the horses of the tribes in the province of Constantine; and Baujol, another army veterinary surgeon, reports it as causing great havoc among the horses in the Bhiras tribe. In 1852 it carried off a large number of mares in the circle of Bon-Arreridj, and in 1853 it prevailed in the circle of Setif. It was not until the spring of 1851 that it revealed itself in France, among the brood mares in the plain of Tarbes, where it for the first time attracted the attention of French veterinary surgeons, being chiefly studied by Roturier and Louchard, military veterinary surgeons, and by an official commission. In 1851 the malady was located in thirty-one communes around Tarbes, containing 1,874 mares. In December of that year Louchard recognized it in 127 mares which had been put to government stallions and to stallions belonging to private individuals. Out of the total number, fifty-two died. It had nearly ceased in the following year.

With regard to the origin of this disease in France, Trelut, veterinary surgeon to the stallion depot at Tarbes, in two able memoirs on the subject, traces its advent to the importation of a stallion from Syria in 1851, and again by two other stallions from the same country in 1861.

He asserts that it was, perhaps, perpetuated in the south of France, because it there found itself in a climate resembling that of Syria, where it nearly always prevails; and also because no steps were taken to thoroughly eradicate it.

It has not been witnessed as yet in England, Belgium, Italy, Spain, or Denmark, nor in countries beyond Europe, Asia, or Africa, so far as I am aware; but there can be no doubt that if diseased stallions or mares are imported to those regions now exempted from its effects, it will appear there, as it has done in Russia (where it is frequent and violent, particularly in the southern governments), Germany, Hungary, Bohemia and France." (*Ibid*, Vol. II, p. 303.)

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equine; it is contagious, and is transmitted in the act of copulation. It chiefly affects the generative organs, though it is not confined to these, but produces serious general disorders of a peculiar character, which most frequently terminate in death. It is more of a chronic than an acute malady; its course is slow and remittent, and affecting more or less every organ in the body, it produces a state of marasmus, hideous in the extreme, before death supervenes.

NATURE.

"Very little is known of the nature of this affection. Some authorities have imagined it to be allied to human syphilis, basing their supposition on the course of the local symptoms, some of the pathological alterations, and the serious character of these. This idea has been rejected by others, seeing that human syphilis is not transmissible to the horse by inoculation." * * * Fleming adds in a foot note: "The most recent experiments of Horand and Peuch are apparently conclusive that human syphilis cannot be transmitted to the domesticated animals." This was written in 1874.

"Klebs, a well-known and thoroughly capable observer, cultivates a spore which he finds in syphilitic blood (apparently a moving bacterium), produces a plant, inoculates it upon an ape, produces consecutive ulcers recalling the ulcers of syphilis clinically and histologically, shows them to Professor Pick, who recognizes their resemblance to syphilitic ulcers, kills the animal, and finds between the dura mater and the skull a material much resembling gumma, and a quantity of organic germs analagous to the forms which had been inoculated upon the animal. Klebs placed a portion of a freshly extirpated syphilitic chancre under the skin of another ape, December 29, 1877. The wound healed without suppuration; the glands swelled slightly. In six weeks the animal had fever, and shortly afterward a crop of papules came out upon the neck, head and face. The papules were flat, two or three millimetres in diameter, and of brownish-red color. These lesions scaled off, but did not ulcerate; and the papules, together with the fever, disappeared, leaving no trace. Nothing

new appeared externally, but in five months after the inoculation the strength of the animal failed and it died. Under the site occupied by the papules during life, although no deeper seated disease had then been detected at these points, the skull showed evidences of periostitis and of caries sicca—exactly such changes as are found in man due to syphilis.

“A focus of interstitial fibrous thickening containing spindle cells was found in the lungs, the pleura being extensively thickened over it in a radiate manner. Certain new formations of cells, resembling young syphilomata, were found in the kidneys. Finally, some blood taken from this ape yielded plants looking very much like the fungus which had been inoculated upon the first ape. Other animals, besides the apes of Klebs, have been successfully inoculated with pieces of chancre or its secretion—guinea pigs (Legros, Bradley), monkeys (Depaul), cats (Vernois, Bradley)—and ulcers and gummata produced, leading to marasmus and death.” (*Keys, ibid.*, p. 62.)

It is an established fact that these same animals are not very susceptible, even to the poison of glanders. Fleming writes: “With regard to species, it is established that mankind, dogs, sheep, goats, rabbits and mice can be successfully inoculated with glanders. Next to the equine and asinine species (in which the malady runs its course most rapidly), with regard to susceptibility, comes the feline, canine and the human species. The receptivity of the dog is not very great; indeed, not many years ago inoculations with glander virus were so unsuccessful in this animal that it was believed it could not be infected.” (*Ibid.*, p. 533.)

Another point of resemblance between the poison of glanders and syphilis that may be suspected is this—that while the dog is perhaps one of the most convenient of animals to experiment on, and is infected with glanders with difficulty, it is noteworthy that syphilis—a milder disease—is not mentioned as having been communicated to it; while the cat—more susceptible to glanderon inoculation—has been successfully infected with the syphilitic poison.

But to return to our main subject again.

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CAUSES.

"The primary cause or causes of this disease are as obscure as its intimate nature, though there is no lack of hypothetical reasoning on the subject. Rodlaff gives, as a general cause, an atmospherical, epizootic constitution, which gradually modifies the animal economy, until the evolution of the disease is possible. He also invokes cosmo-telluric influences, and asks if the frequency of the storms in the mountains of Bohemia and Silesia has not contributed to render the malady more common than in previous years. This distinguished veterinarian also believed that hereditary tendency, a catarrhal condition, cutaneous eruptions, betraying a lymphatic dyscracy, were all so many predisposing causes.

Hertwig and Renner attributed its production to fornication or beastiality; and Dumas mentions that the Arabs, believing it to be contagious and incurable, think that the male ass infects the mare, the former acquiring it from the female ass, which is diseased through an abominable offense committed upon it by the Arabs suffering from syphilis, and who fancy that this odious practice will cure them." (Fleming, *ibid*, p. 12.)

This theory is beyond comparison the most plausible and reasonable of the many offered, and we shall follow it out to its close.

There are many theorizers—men of ability—whose minds seem to demand some marvellous conception for a cause; the more marvellous, the more nearly they imagine they are approaching the truth. They remind one of the witness who stated that he had read "Gulliver's Travels," the stories of Munchausen, and the "Flying Wife," including "Robinson Crusoe," and believed them all; but that Wirt's "Life of Patrick Henry" was a little more than he could stand.

SYMPTOMS.

The symptoms of this equine disease are exceedingly numerous, and we can mention only a few of them—the most important—in this place. We may say here—though it will be inferred—that it is our opinion that this venereal disease is only glanders

(or a syphilis) in a mild form, which in time comes to assume its old proportions, as will be seen further on.

"In France, the symptoms of the disease in the stallion do not appear to be so marked as in the mare, and not unfrequently several weeks pass away without any indication of its existence being manifested."

Besides the "indurated sores" of the genital organs, swellings of submaxillary, axillary and inguinal lymphatic glands, the constitutional manifestations are very remarkable.

"The general symptoms appear in the following sequence Emaciation, lameness, nervous derangement, paralysis, marasmus, glanders and farcy, and death. The debility is so extreme that the victims can no longer stand, and their hinder legs dropping under them, leaves them sitting like a dog, vainly endeavoring to maintain their equilibrium; the face haggard and the countenance pinched; the sunken eyes, expressive of terrible agony, which is made all the more sad by the futile attempts to rise—we have a startling picture of the effects of an equine venereal disease."

And yet we are told that "syphilis, as such, is never known to occur in domestic animals." Call this malady by what name you will, it certainly is a constitutional disease of a venereal origin, which, had we space to quote from its numerous symptoms and pathological anatomy, would be seen to invade almost every tissue and organ of the body.

Its identity with syphilis is complete in every particular, so far as the constitutional difference of the horse will permit, and any one who studies the two diseases carefully must come to the same pathological conclusion. The reader will please to bear in mind that "glanders and farcy not unfrequently accelerate the final catastrophe." Do any symptoms of this disease resemble glanders? Nearly all of them do, except the nervous phenomena, which are most like those of syphilis, due, we suspect, to a more rarification or potentization—if we may so call it—of the poison. These latter symptoms, in the human subject, did not manifest themselves until of late years, owing to the disease becoming milder.

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tem through the nasal passages, and this venereal disease through the genital organs, the discharge from these respective parts should bear some points of resemblance if the diseases are analogous or the same.

In the former case, "this discharge may be at first transparent, and at a later period opaque and viscid, collecting around the margin of the nostril. * * * The character of the discharge is noteworthy. As has been said, it is glutinous and adheres to the skin and hair around the nostrils, forming soft, greasy-feeling crusts of a deep brown color, which adheres to the fingers when touched," etc. In the venereal disease, "there is a vaginal catarrh, the matter being viscid, glutinous—it adheres to the hair, soils the tail, perineum, inner surface of the thighs and the hocks, and in drying forms yellow or brownish crusts." (Fleming, *ibid*, Vol. I and II, pp. 486, 316.)

As striking a resemblance can be pointed out between the chancre of these diseases, but this would lead us too far; and our object so far has aimed to be only suggestive; to create enough interest, merely, in our subject to induce those in favorable positions to institute—to test the validity of our views—the necessary experiments.

(*To be continued.*)

FOWL CHOLERA AND THE GERM-THEORY OF DISEASE.*

By D. E. SALMON, D.V.M.

No longer than a year ago, there were so many criticisms of the germ-theory continually appearing in our medical and scientific periodicals that the writer felt it a duty to place the evidence bearing on the question before the working microscopists of the country in such a connected form that they could scarcely fail to appreciate it. Accordingly the investigations of the best studied of the contagious fevers, viz., charbon, were reviewed in two articles published in the *Journal* of April and May, 1881, and the conclusion reached that there could no longer be a shadow of

*From *The American Monthly Microscopical Journal*.

doubt of this disease being produced by the multiplication within the body of the *Bacillus Anthracis*, a variety of bacteria.

After patiently waiting a year to allow those who oppose the germ-theory ample time to place their objections to this evidence on record, without any such objection appearing, it may be concluded that, up to this time at least, there are no substantial grounds for doubts. Still, we occasionally see elaborate articles intended to prove that the bacteria of contagious diseases are nothing more or less than one of the forms assumed by coagulating fibrin—that the micrococcus is granular fibrin, the bacillus, thread-like fibrin and the spirillum spiral fibrin;* and although it may now be assumed that a majority of our scientific men are convinced of the truth of the germ-theory, the evidence upon which it rests is yet entirely too slight, if we except the single disease alluded to.

As a working theory, we have seen more light thrown upon contagious fevers by its use for half a dozen years than was gained before in the whole history of medicine; but notwithstanding this, its true friends do not care to press its acceptance in advance of the actual results obtained by scientific investigations. Charbon, as we have seen, is the foundation of our structure, and we may feel certain that this foundation is secure, and will never crumble beneath the successive additions that may, from time to time, be placed upon it. Has the time arrived, therefore, when we may confidently announce that the first story of the edifice has been reared upon the foundation, and that it is so well finished as to be perfectly safe for use, and to serve in turn as a support for future work? The writer believes that this time has come, and will proceed at once to a consideration of the work accomplished.

The domesticated fowls of various countries, including our own, are subject to a most virulent and fatal disease, which, year after year, almost depopulates the poultry yards of vast sections, and causes enormous aggregate losses. This disease may be communicated to healthy fowls by placing these in the same enclosure with sick ones; by feeding them with the flesh or blood of

*Rollin H. Gregg. M.D. No Bacteria in Diphtheria.—*The Medical Record*, Feb. 1, 1882.

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recently dead birds; or by introducing portions of the flesh or blood of very sick or dead birds beneath the skin. The disorder is not accompanied by eruptions on the skin, but is characterized by elevated temperature, dullness and loss of appetite, often deep somnolence, by paleness about the fleshy part of the head, and by yellow coloration of that part of the excrement which is separated by the kidneys. The most marked and constant lesion is an intense congestion of the liver, with enlargement and softening; and there are frequently other complications which, for the purposes of this communication, it will be unnecessary for me to enumerate. My aim is simply to establish the fact that this is a virulent internal disease, or in other words a contagious fever.

A little over two years ago, M. Pasteur presented his communication on this subject to the Academy of Medicine,* and shortly afterwards the writer began his investigations of it, which were continued until the present, and are not yet entirely finished. The facts demonstrated by these researches, which bear upon the etiology of the disease, are briefly as follows:

1. *The virulent liquids of the fowl's body contain micrococci.* If we examine the blood or tissue-juices of a bird nearly dead of cholera, or from one that has recently died, we may find a considerable number of granules having the dumb-bell form, or some apparently single globules, caused by one part being directly beyond the other in the line of vision. These bodies are extremely small, less than one-thirty-thousandth of an inch in short diameter, and perfectly motionless. If the microscopist relies on this examination alone, however, it would not be strange if he remained in doubt as to the nature of the granules which he has discovered. They might very reasonably be considered as granular fibrin, as the debris of broken down cells, or as particles of uncertain nature which have gained entrance from the atmosphere. It will be found difficult in many cases, if not generally, to obtain the bacterial reaction to coloring matter by staining with analin, violet, or other agents.

*L. Pasteur. Sur les maladies virulentes et en particulier sur la maladie appelee vulgairement cholera des poules.—*Bulletin de l'Academie de Medecine*, 1880, p. 121.

Fortunately, the microscopist of to-day has the means of accurately determining the nature of such granules—this is accomplished by their cultivation in suitable media. Pasteur demonstrated that these granules might be cultivated in a liquid obtained by simmering the muscles of fowls in water and afterwards filtering to transparency and sterilizing by heat; this I have confirmed by long-continued and careful experiments.

Can we be certain, however, that the organisms which we are cultivating really existed in the blood of the fowl while circulating in the veins, or may they not have gained entrance from the air? This objection is more pertinent than many imagine, for, notwithstanding assertions, very few persons, taking the world over, have made pure cultivations from virulent liquids. Klein believes that he has done this with the virus of the disease which he calls *pneumo-enteritis* of swine, and which is so well known in this country as hog cholera; but my own investigations do not confirm this, for I have always obtained by cultivation an entirely different organism, being the one which Klein himself discovered in the tissues of affected animals, and which he was led to discard by what I am forced to consider most imperfect cultivation experiments. Even Drs. Wood and Formad are constrained to admit that in their cultivation of the supposed virus of diphtheria if the temperature was varied, a different organism frequently appeared.* These gentlemen selected the cultivation apparatus which misled Klein, and which, to say the least, is hardly suited to investigations of this delicate nature.

The writer has used an apparatus of his own, which will be fully described in his report to the Department of Agriculture of 1881, and which in his hands has given the most complete satisfaction. Instead of using one or two drops of liquid for a cultivation medium, the usual quantity is half an ounce; and this has been increased for special purposes to a quart. A small fraction of a drop of virulent blood added to such an apparatus, with suitable precautions for excluding atmospheric bacteria, will cause

*Drs. H. C. Wood and H. F. Formad. Report on Diphtheria.—*Supplement No. 17, National Board of Health Bulletin*, p. 6.

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the limpid liquid which it contains to become opalescent, or turbid, within twenty-four hours, and a microscopic examination shows this turbidity to be due to vast numbers of the dumb-bell forms already mentioned. If the blood is obtained and introduced with proper care, it will be in vain for us to search our preparations for other forms of bacteria, and no matter how long we preserve our cultivations, or at what temperature we keep them, the result will be the same. Having made a pure cultivation of the organism, if our apparatus is perfect it will remain pure indefinitely.

With a single cultivation and without other tests, we might be uncertain whether the bacterium obtained really existed in the blood, or whether it was of atmospheric origin; but when we have repeated the experiment a considerable number of times, always obtaining organisms morphologically the same, and these very different in essential characteristics from the bacteria which multiply in similar liquids after exposure to the air, we are warranted in concluding that they were not introduced from the air but from the blood.

Now, when we have proved that a certain bacterium exists during life in the blood of affected birds, is that good evidence that the disease is caused by such organisms? Evidently, it is very insufficient, but fortunately we are able to satisfy the most fastidious on this point, by additional facts.

2. *Liquids in which bacteria are cultivated produce the disease by inoculation.* If we add one-fourth of a drop of virulent blood to five hundred drops of cultivation-liquid, and place this in an incubator at 90 deg. Fahr. for twenty-four hours, or until the development of micrococci has produced turbidity, we find that inoculation with this liquid as surely produces the disease, and that this is as fatal as when virulent blood is the material used. But there is a point here that is nearly always overlooked by those who make this class of investigations: perhaps this cultivation, as we call it, is only a dilution of the original virus—a dilution not sufficient to destroy its activity. We have used a half-ounce or more of liquid, and have made a dilution of 1 to 2000—a dilution much greater, it is true, than is usually made by those

who cultivate in but a drop or two of fluid in a small cell—but it is our object to give a scientific demonstration, and not to follow in the uncertain footsteps of those who have preceded us. To test the extent to which the virus may be diluted, we inoculate healthy fowls with a drop of various dilutions of our cultivation-liquid, obtained as above, and which may be called the first generation, and we find that a dilution of 1 to 2000 almost invariably produces death. The virulence of a first cultivation then proves nothing, and we must stop to inquire the extent to which virulent liquids may be diluted and still prove fatal when there is no opportunity for reproduction. Experiments show that death is frequently produced by dilutions of fowl cholera virus of 10,000, but rarely by those of 1 to 20,000 or 1 to 40,000, and seldom, if ever, by greater dilutions.

We are now in a position to judge if the virus really multiplies as we know the bacteria do. We have found the extent to which the first generation must be diluted to destroy its virulence and we make a second cultivation which dilutes the first as the first dilutes the blood; after twenty-four hours we start a third cultivation, and now the first is diluted in the proportion of 1 to 4,000,000, or far beyond the extent to which it was found possible to dilute it without destroying its properties when no cultivation was allowed. Have we in this case destroyed the virulence? No, indeed; a single drop of the third, fourth, fifth or sixth cultivation will destroy ten thousand fowls as surely as a drop of the first. The virus has been cultivated then, has multiplied, and is capable of indefinite multiplication. Our liquid swarms with micrococci, and nothing else can be found by the most careful microscopic examination. If we expose virulent liquids to atmospheric germs, putrefaction soon occurs, and their activity is lost. Why has not the same result followed in our cultivation-liquids, if the bacteria multiplying in them were foreign to the virus? Have we not, even here, a strong indication that these organisms are the active principles of the virus—that they produce the disease?

3. *The living bacteria are required to produce the malady.* There are three hypotheses which one must take into account in

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determining the active principle of even this cultivated virus: 1. The pathogenic agent may be a soluble ferment. 2. It may be living particles (bioplasm) extremely minute, or having the same refractive index as the liquid in which it multiplies, and therefore invisible. 3. It may be the bacteria to which our attention has already been directed. Pasteur has shown that by filtering the cultivated virus through plaster, the solid particles are removed and the limpid liquid which is obtained is perfectly harmless, even when injected under the skin of susceptible birds in considerable quantities. Objection being made to the filtering as liable to remove some dissolved bodies as well as the solid particles, the same able investigator has given us another and very valuable demonstration. If tubes containing cultivated virus are placed where the temperature is constant, the micrococci are all deposited on the bottom of the apparatus, leaving a perfectly limpid liquid above them. Inoculations with this liquid prove it to be as harmless as that which has been filtered.*

Even this demonstration was insufficient to convince those who oppose the germ-theory—the ferment might be very volatile and escape from the upper layers of the cultivation-liquid, or it is attached to the bacteria themselves, and can only be introduced with them. To meet such objections the writer has carried through an entirely different line of investigation. It was found, after considerable experimenting, that the activity of the virus is destroyed at a temperature of 132 deg. Fahr., if maintained for fifteen minutes—a temperature so low that few, if any chemical bodies would be affected by it if protected from atmospheric gases and evaporation. Small glass tubes were, therefore, completely filled with virus, hermetically sealed, and placed for a quarter of an hour in water of this temperature. Here there was no chance for any constituent to escape, and the dead organisms might be introduced into the inoculation-punctures with whatever chemical products there might be adhering to them. Now, what is the result of inoculations with virus treated in this way? Experience shows that a million times as much as produced death

* *Bulletin de l'Academie de Medecine*, 1880, p. 530.

before, is now unable to cause the least sign of disease. The liquid is no longer capable of producing the affection.

Still, our opponents may maintain the demonstration more or less imperfect—the activity of the virus is destroyed at this low temperature, it is true, but what evidence have we that the bacteria were destroyed rather than the other agents which we have supposed might constitute the active principle. Some bacteria resist a boiling temperature for a longer time than this; others multiply rapidly, and seem to enjoy a temperature nearly thirty degrees above that to which we have subjected our virus. Is it not impossible that the micrococci under consideration were killed at so low a point?

The fact that this virus is destroyed so easily, and that bacteria often resist so high degrees of heat, certainly makes our evidence so much the stronger if we can prove that the micrococci which we have cultivated are actually destroyed at this point; for it would be extremely improbable that an accidentally introduced organism would be destroyed at exactly the same temperature as some unknown agent which was present, and upon which the activity of the liquid depended.

Let us take two sets of the cultivation-apparatus containing sterilized liquids of the proper kind, and to each of these add, with suitable precautions, a minute quantity of a pure cultivation of the micrococci. The one we heat for fifteen minutes to 131 deg. Fahr., the other to 132, and place both in the incubator to await developments. In twenty-four hours the former is turbid with micrococci, but the latter is as limpid as at first; we wait for two or three days, but there is no change in our results. We now inoculate a number of fowls from each apparatus, and find that in those cases where the liquid containing the micrococci is used the birds contract the disease, while those inoculated with the clear liquid are not affected in the least.

Our demonstration is now complete—we have started with the micrococcus and tested each hypothesis without other result than to show that they are both untenable, and after traversing the whole circle of investigation we are led back to the organism as the pathogenic agent without which in a living condition there is no virulence.

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We believe, therefore, that the second step in the germ-theory is taken, the second story of the structure finished; and we place the results before the scientific world with the fullest confidence that they will be confirmed and accepted.

It will be noticed that many of the investigations appear on their face to be rather of a chemical or pathological nature than microscopical, and as such would be out of place in this *Journal*. I beg leave to remind the reader, however, that no one but a microscopist can succeed in such researches—the microscope is necessary at every step, and it has been a part of my purpose to show that the microscopist who undertakes to solve these difficult questions must be prepared to use other apparatus in connection with his instrument.*

FOUR CASES OF RINGBONE, TREATED BY NEUROTOMY.

BY R. HARRISON, D.V.S.

In the April number of the *REVIEW* the operation of neurotomy was recommended as a very favorable method of treating ringbone by M. Nocart of Alfort. Since this report I have operated on four cases, and it may be of interest to report them, as the result in every case was not favorable.

Case No. 1.—Bay mare, 16 hands high, 7 years old, had been lying idle for seven months, on account of extreme lameness; had been fired and blistered previously with beneficial result for a time. When seen, she was so lame as not to be able to put the foot to the ground. The near hind foot was the one affected, the growth extending in front and to the sides, more on the inside than out, giving rise to ankylosis of the coffin joint as well as of the second phalanx.

On the 5th of July she was operated on, and immediately following it, she seemed lamer than before, which was considered to be due to her severe struggles while being cut and during the operation. For several days following she improved steadily, and would even trot quite nicely. A shoe with high heel calkins and

*My investigations have been published in the Reports of the Department of Agriculture.

no toe calk was put on, which improved her gait a great deal. She remained in the infirmary, having gentle walking and trotting exercise every day, until the latter part of the month, when she was sent home, with instructions given to use her carefully for walking work.

About a month after she was reported as lame as ever, and I was desired to see her. I found that she had been worked in a market-wagon, traveling a distance of 32 miles each day. She was quite lame, but when harnessed, after a few yards, traveled as well as ever.

Since the mare has been left with me for the expense of treatment, she is lame, but shows it but little in walking. The irregularity is merely mechanical, and I think she would be well in the country if the land was not rough.

Case No. 2.—A bay mare, 15.3 hands high, 6 years old, had a ringbone as a sequelæ of a toe-crack on the near hind foot. The bony growth was as large as a hen's egg, flattened from side to side, and situated in front of the coronet. Deep firing, repeated six times with platinum needles, was first resorted to, with two months' rest at pasture. By this treatment little benefit was derived. Neurotomy was advised, and was performed. The relief in this case was marked from the first; the wounds healed by first intention, and since then the mare has worked as well as formerly.

Case No. 3.—A brown mare, 7 years old, 14.3 hands high, with ringbones and side bones on both fore feet, was lame on the near one. The bony growth in this case was small, extending from cartilage to cartilage. The operation was performed on both feet with good results.

Case No. 4.—A brown gelding, 10 years old, 15.1 hands high, with ossification of the lateral cartilages and exostosis in front of the coronet on both hind feet. The lameness was greatest in the off foot. The exostosis in both feet was undoubtedly of long standing and had given rise to ankylosis of the first with the second phalanx. Neurotomy was performed on the off foot, and the result was an improvement, but not as successful as could have been desired. It gave rise to a peculiar stilty action.

Case No. 5.—This patient was operated on since the above re-

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port was written. It was a bay gelding, 16 hands high, 5 years old, with an exostosis in front of the coronet, well-defined, but of small size. The operation was a complete success. In this case deep firing was resorted to afterwards, so as to check the growth which was of recent origin.

Summary.—It would seem, therefore, that this treatment should not be adopted in all cases with the hope of complete success, for in those cases where the bony growth is extensive and gives rise to ankylosis, either of the pastern or coffin joint, lameness purely mechanical will follow. Where other modes of treatment fail, it should be used, for otherwise the lameness would be greater and the pain attending it more severe. It would be of advantage to fire deeply afterwards, to check the growth and favor absorption of the plastic deposit, which has a tendency to interfere with the action of the joints.

The operation should not be condemned if the patient does not improve at once after the operation has been performed, as the force of habit, especially if the lameness has existed long, will render the animal lame when he first starts off.

EXTRACTS FROM PAPERS

Sent to the Meeting of the United States Veterinary Medical Association.

CEREBRO SPINAL MENINGITIS—FUNGOSUS TOXICUM PARALYTICUS.

By J. C. MICHENER, D.V.S.

During two weeks of the middle part of April, we had in Hilltown and Hatfield townships, within a radius of four miles, a remarkable outbreak of what in this vicinity is called choking distemper—what is sometimes (I think) miscalled cerebro spinal meningitis. For want of a name, I call it fungosus toxicum paralyticus. You will recognize it by the symptoms. A horse will be in perfect health one hour, the next he will be observed to chew feebly and slowly and feebly drop cuds of masticated hay, unable to swallow. In his efforts to drink he will thrust his nose deeper into the water than usual and go through all the motions of deglutition without accomplishing it, the little water he is able to raise above the bolus of the tongue returning through the nos-

trils. No swelling, soreness, or pain attending his efforts, he persists in trying to drink a long while, only stopping to cough occasionally, as if choked, hence the name choking distemper. He is feeble in his movements; has very little use of his tail; soon goes down, unable to rise, lying flat on his side; legs extended; has occasional nervous paroxysms, striking violently with all his legs; the tongue hangs loosely from the mouth, lips contracted, mouth partly open; stertorous breathing; cold sweat; death. Some cases die in four hours, many in from thirty-six to forty-eight. Those living over the tenth day usually recover, under good management. The paralysis is mostly general, although in some cases it is almost entirely confined to the par vagum, the power of deglutition being lost, but he is still active and strong upon his legs. Other cases lose the use of their limbs, but can swallow perfectly. In rare cases, one front leg will be weak and trembling; in others, one side of the face is paralyzed, the lips drawn to the opposite side. This disease is characterized by absence of inflammatory symptoms, except a congestive form in the last stages of some cases. Pulse about normal, slightly intermittent, weak and compressible; surface of body cold; sweats and tremors.

We have this disease every year, and at all seasons. It is the most common disease of our district. When the paralysis is *general and complete*, they die, and are not many hours about it; when local or incomplete, many recover. Taking one time with another, about half recover under my treatment. In the particular outbreak of which I now write, there were upwards of forty deaths and not a single recovery. It only lasted two weeks. In every case brewers' grains, in a sour condition, were fed to the horses or stored in the barn. All those in the district that did not use the grains escaped the disease, and every horse that ate of that particular ear load of sour grains died. Cows were not injured by them. I have known brewers' grains to cause the disease in other instances. In one case a farmer lost all of his horses, five head, from feeding oats that had a smut upon them that could be seen and smelt when they were agitated in the bin. Some of these oats were afterwards fed to horses in three different stables in Philadelphia, and killed them in a like manner. In

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many other instances I have been unable to specify the cause. Mouldy barns and those upon meadow banks are the ones in which the disease is most commonly found. My conviction is strong, that by the aid of the microscope the cause could be found, and would consist of fungus spores floating in the air or adhering to the feed. The fumes of burning sulphur have the best preventive, and stimulants the best curative effect. Autopsies, with the unaided eye, are unsatisfactory, no sufficient cause for death being found. The poisonous cause, be it what it will, acts upon the nerve centres, with depressing, paralyzing effect, overcoming and destroying the functions of the bodily organs, without making much alterations in their appearance. We sometimes observe slight congestion of the cesophagus and air passages, and in lingering cases putrescence.

CESTRUS OVIS—STRONGYLUS FILARIA.

By T. T. WINCHESTER, D.V.S.

In the winter of 1882, I was called to see a flock of sheep, with the following history:

The owner bought sixty sheep in the fall of 1880, and it was soon noticed that there was a discharge from the eyes of a few, and they also coughed a little. These symptoms grew gradually worse, and in connection with them there was a discharge from the nose. A few died that winter. In the spring of 1881, some were sold and the rest turned to pasture, some of them coughing and running at the nose. When I saw them quite a number were discharging a muco-purulent collection from the nose, had a hard racking cough, and were very much emaciated, some being unable to walk. Before reaching this stage, they lose their appetite, become dull, have a slow and weak gait, tossing and turning of the head, inclined to butt and push with the head, and fits of frenzy, when death generally results.

Post mortem. The digestive apparatus normal in appearance, with very little faecal matter in stomach or intestines. On removing and opening the lungs, found in smaller bronchial a large number of fine, white, thread-like parasites from 1 to $1\frac{1}{2}$

inches in length, and considerable bronchitis. The pericardium contained, in one or two instances, from 1 to 1½ ounces of fluid, very clear and transparent. On making vertical section of head, found a quantity of pus around the turbinated and ethmoid bones, the mucous membrane of the same congested very much. In one case the ethmoid was carious and the larvæ were working their way toward the brain.

OSTEO-POROSIS.

BY N. E. REINHART, V.S.

I met this disease in a horse not quite five years old, the property of a gentleman who had never worked or driven the horse hard. To use his own language, the horse never did a day's work in his life. His object was to let him mature and become a horse before he put him to hard work. The first symptoms were hock lameness, and spavin was suspected and treated as such, with apparent recovery. When the other hock became affected, he began to show a defect in masticating his food. He would chew grass and let it fall from his mouth in quids all around him, swallowing none. Fluids could be taken, but feed of a solid form would be dropped. His mouth was examined, and the molar teeth smoothed at their outside edges with a tooth rasp, but there was a fulness of the gums about the front teeth like lampus, in both upper and lower jaw. Osteo porosis was suspected, but as yet there was no enlarged head. It was a puzzle to me, having never met the disease. I gave him tonics, with a view to improve his appetite and invigorate him; washed his mouth with tinct. myrrh and other astringents, but all to no purpose; he continued to grow worse, and the head began to enlarge, and the fact dawned on my mind that here was a plain case of osteo porosis. About this time Dr. James McCoart, of Philadelphia happened to be with me, who confirmed my diagnosis. We told the owner that the horse would not recover, and would perhaps starve to death. About a week after this visit, he got down in the stable and could not rise; when assisted, it was found he could not stand. The owner having been told by us

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that he might at any time lose control of any part of his joints, as the bones were in such diseased condition, suspected what had happened and had him shot. I was called to make an autopsy, and found the dorsal vertebræ had separated and was very soft, the bones all soft and easily cut with a knife, and the periosteum easily stripped off; bones porous, like honey-combs. This horse was raised in Central Pennsylvania, on high ground. His ancestors, for several generations, were all healthy. He was owned by an old and experienced horseman, and was well cared for. If any brother in the profession can point out a cause for this disease, and its treatment, he will confer a great favor. This case continued about six months from the time my attention was first called to it.

RABIES IN A MULE.

By C. W. CROWLEY, D.V.S.

I witnessed a case of rabies in a mule in June last. Its history is as follows: Up to the second day previous to my seeing the animal nothing was ever noticed wrong with him; at this time he was noticed somewhat nervous and irritable. The next day he was sent to be shod, and so far from acting as quietly as he usually did, he became very much excited. Upon the driver going to the animal's head to try to quiet him, he sprang at the man, seized him by the arm and threw him on the floor. Before the mule could be beaten off he had bitten the man severely, both in the arm and leg. After this the mule was so excited and vicious that it was concluded to take him home and bring him back the next day, when it was expected by the blacksmith that he would be quieter. The next day he was no better—if anything, worse—so he was hitched with his mate and driven to the infirmary of the person who was their medical attendant. Here a diagnosis of hydrophobia was made, and the destruction of the animal recommended. But the owner was not satisfied, so I was called to see him, when I concurred with the practitioner in charge, in both particulars. It was intended to have the animal shot in the afternoon, but he died before that measure had been

carried out. The mule at the time I first saw him, at 9 A.M., was furious—biting at everything within his reach. A pail of water was put on a wheelbarrow and shoved near him, but instead of trying to drink, he seized the wheelbarrow and pulled it away from the man who was holding it. In about twenty minutes he became more calm, although perspiring continually and passing slight quantities of urine at short intervals. He died that afternoon about four o'clock.

VENTRAL HERNIA.

By W. F. DERR, V.S.

On the 4th of June, 1882, I was consulted about a four-year-old colt that had received an injury by getting staked on a fence two years ago. The abdominal muscles were lacerated to a certain extent at the time of the injury, but as the hernial sac was enlarging, the owner thought that there might probably something be done for it.

The hernia extended as far forward as the cartilages of the false ribs, and back towards the sheath, measuring eleven inches in length, five in breadth, and protruding to the extent of about five inches.

After first warning the owner that the operation was a dangerous one, and he consenting to have the animal operated on, I proceeded as follows:

The animal being in a healthy condition, I merely kept him off feed for a few days, in order to get the abdominal cavity as empty as possible with laxatives, etc.

On the 7th of June I had him placed under chloroform, got him on his back, and made an incision carefully through the integument into the sac, right through the centre of the hernia, seven inches in length. The sac was partly filled with omentum, of which I removed a portion with the ecraseur. The walls of the hernia were very much thickened and smooth.

I had a sponge soaked in a weak solution of carbolic acid, and then pressed out and placed in the abdominal cavity. I then

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shaved the walls of the hernia all around, and the hemorrhage from it was taken up in the sponge. The hemorrhage was slight, from the scarification of the parts.

I also had a fine spray of carbolic acid—one part to two hundred—played on the parts during the operation.

I removed the sponge by drawing the walls apart while my assistant took it out, it being fastened to a cord.

I brought the parts together with strong metallic wire sutures, of which I put in seven interrupted ones, and let the ends come out through the skin.

I placed a wooden clamp of fourteen inches in length over the whole integument, and had small skewers pushed through this, in order to hold the clamp and let my patient rise.

He suffered considerably for a few days, but nothing alarming. In fourteen days the parts sloughed off, and also two of the metallic sutures came away. On the seventeenth day all the sutures came away, leaving a large, healthy, granulating surface, which healed rapidly with weak solutions of carbolic acid, etc., and tonics internally, so that in a month from the time of operation the wound had healed, leaving a cicatrix the size of a silver dollar, the animal went to work, and the operation a success.

TUMOR OF THE GUTTURAL POUCHES.

BY W. C. BRYDEN, V.S.

A very interesting case was treated and afterwards examined by me for the Boston Fire Department. The horse was attacked with what was supposed to be acute laryngitis. His throat was treated in the common way, with gargles and counter-irritants externally, without improvement, for about six weeks. When I was called in, he stood with his head well up, and could move about freely; but on taking drink or food the greater part returned through his nostrils, which were much injected and covered with filth—the walls of his box being also all bespattered. There was slight swelling of the intermaxillary glands, but the parotids and adjacent parts appeared shrunken, and any effort to

swallow painful and difficult, although he evidently did get some down. In spite of all we could do he became daily more emaciated, when, to put an end to his misery, he was finally killed about three months from the time he was attacked.

The head and neck were brought to me for examination. Careful dissection showed nothing to account for the trouble until the guttural pouch on the left side was reached, when a circular tumor, about two inches in diameter and three-fourths of an inch thick, was found attached to the inner wall. The posterior extremity of the long horn of the os hyoides was also highly inflamed and hypertrophied to three times its natural size.

CEREBRO-SPINAL MENINGITIS.

BY THE SAME.

A small-sized bay mare belonging to Mr. Lam, of East Boston. She stood alone in an old stable, low and damp. I immediately recognized the case as one of spinal—or rather cerebral—meningitis, as described by Prof. Large in *The Veterinarian* some fifteen years ago, and also by myself in the same journal several years later (his description of the disease being at the time unknown to me). She stood rather quietly, but persistently, trying to swallow water; but although the muscles of deglutition seemed to go through the motion of swallowing, the quantity of water in the pail remained unchanged. Next day she went down, and of course I supposed it was all up with her, but as she seemed to rest well, advised the owner to keep at work on her with gargles of carbolic acid solution with capsicum added, stimulating applications externally, and general good nursing. Judge of my surprise, on calling two days afterwards, to find her up, walking around and eating and drinking quite well. About two days after this I was again called, and found her down, unable to get up—this time with regular spinal meningitis (so called); pulse 38; urine and fœces retained, and unable to use her hind parts enough to get up. We placed her in slings, and she made a good recovery.

DISLOCATION OF THE OS CALCIS.

BY G. AGERSBORG, D.V.S.

I had a singular case—if my diagnosis was correct—of dislocation of the os calcis in a two-year-old colt, produced by a kick of another horse. The bone on examination was found bent outwards and downwards at an angle of little more than 45° , followed in its course by the tendon of the perforatus muscle still adhering; there was very little swelling, but considerable tenderness; no crepitation was noticed, hence my opinion of simple dislocation, although difficult for me to understand how this can take place. The bone yielded on manipulation, and was restored without difficulty to its proper place and secured by means of a plaster Paris paste enclosed in a pasteboard form, left on for five weeks, when the colt was discharged, leaving no lameness. A small curb is all that is left to tell the tale.

POISONING IN A COW BY EUPHORBIA MARGINATA.

BY THE SAME.

A case of poisoning in the cow from eating the euphorbia marginata was observed. She presented the following symptoms: Temperature, 93° ; respiration, 18° ; pulse not perceptible; at each respiration an extremely deep and harsh moan, as if in the greatest misery; head stretched out on a parallel line with the neck; ears and horns very cold and slightly moist, coupled with anorexia; did not move nor could be made to move from her position, which was erect; eyes dull and half-closed; regurgitation suspended; frequent attempts to vomit, and a little froth at the mouth. She was treated with large doses of saline cathartics and copious drinks and emetics of a mucilaginous character. She gradually recovered in four days.

THE ARMY VETERINARY DEPARTMENT.

BY A. A. HOLCOMBE, D.V.S.

In no country in the world having any claim to consideration as a progressive power has veterinary science received so little attention as in the United States. The recognition accorded the veterinary profession by the Government has been more marked by its absence of appreciation of importance than for any other quality. Stress of circumstances in 1862 forced the Government to establish a Veterinary Department for the Army, and similar causes compelled some of the individual States, and the Agricultural Department in 1879, and more recently the Treasury Department, to seek escape from impending disaster to our large and rapidly-growing live stock trade, by recourse to the protective efforts of the veterinary surgeon's skill. Notwithstanding this recognition has always come with the poor grace of acts not voluntary, it is preferable to being entirely ignored, for it presents the opportunity of attracting public attention by rendering valuable public service.

But the fact cannot be disguised that the veterinary surgeon who attempts to serve his Government in an official capacity finds himself surrounded and hampered in his work by the most annoying circumstances. This is perhaps more true of the army veterinary surgeon than of one in the civil service, for the duties of the former consist of an unbroken routine, apt to become most demoralizing from the entire absence of any stimulus to do better.

That the practice of veterinary surgery is recognized as an important factor in maintaining the health and consequent efficiency of the public animals, is sufficiently demonstrated by the early establishment of the Army Veterinary Department; but that the Government appreciates fully what the duties of the veterinary surgeon should comprise, and recognizes the difference between the scientifically educated and the uneducated, is not so apparent.

Until 1879, the orders of the War Department made it possible for anybody to become a regimental veterinary surgeon, so it

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is not at all surprising that the Veterinary Department, as then established, was most noted for its wonderful inefficiency and entire lack of knowledge of even the rudiments of veterinary science. But great as has been the improvement in some respects of this department, it is still of but little credit to itself, to the Government, or to the profession it cannot be said to represent; and it will remain in this condition until some radical changes are effected. If it is so great a desideratum that all appointees in future shall be graduates in veterinary surgery, as is required by the order of the War Department of March 27, 1879, how much more important would it seem that the ability of those appointed before this provision was adopted should be determined.

From a sentimental standpoint there may be objections to discharging from the civil service, on account of simple inefficiency, individuals appointed prior to 1879; but that such a proceeding would prove of inestimable advantage to the Government, and that the animals in the public service are entitled to intelligent veterinary attendance, cannot be doubted. The service rendered to the Government by the Army Veterinary Department ought not to be less efficient than that performed by the Medical Department, for its importance, although differing somewhat in character, is not less great. Outside of the temporary service which each individual renders, it may be said that the Veterinary Department accomplishes nothing, for the monthly reports are unreliable and most imperfect; observations as to the effects of climate, altitude, labor, exposure, food, water, etc., are not considered of sufficient importance to demand attention, while no provision whatever is made for detecting the most flagrant violations of all the principles underlying the science of medicine and surgery. That such a department is not in good repute is not to be wondered at; but the fault and the remedy lie with the Government, for the department is precisely what the Government has made it, and it will never be better than the Government is willing to require.

Before this department can be made what it deserves to be, no doubt the Government will find it necessary to make the

veterinary surgeon's position endurable, as other countries have done; for it cannot be expected that any talent will seek a position to which there is attached no rank or social recognition, where promotion is impossible, and compensation for the service rendered most inadequate. When these inducements are offered by the Government, the materials out of which to construct a creditable veterinary department will present themselves. But when can such a change for the better be expected to take place? I fear not for some time to come, so the question now is, How can the present veterinary department be improved? I believe the following answer is a comprehensive one, and capable of immediate application: Congress provides for the employment of fourteen regimental veterinary surgeons, and *as many more by the Quartermaster's Department as may be necessary*. This last provision has not been taken advantage of, except in one instance, the employment of a veterinary surgeon by the Department of the Missouri. But the opportunity is here offered for the establishment of an effective veterinary department without the further intervention of Congress. There could be appointed for service in the Quartermaster's Department:

One chief veterinary surgeon, at a salary of \$2400 a year.

Seven department veterinary surgeons, at a salary of \$1800.

—— Post veterinary surgeons, at a salary of \$1500.

The first to be on duty at the Headquarters of the Army, to revise all requisitions for veterinary supplies, compile and prepare for publication all veterinary reports, and render such other service to the Government and public animals as may be determined necessary by the Quartermaster-General. The second class to do duty at the Headquarters of the Departments of Dakota, Platte, Missouri, Texas, Arizona, Pacific and Columbia. Duties to consist of revision of all department requisitions for veterinary supplies, revision of all inspection reports of animals condemned for sale or destruction, the inspection of all animals presented to the Government for purchase, supervision of the treatment of all outbreaks of disease, and such other service as may be required of a veterinary surgeon. The third class, to be appointed in such number as may be required, to perform the

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duties devolving on a veterinary surgeon, at such posts as are without but in need of veterinary service.

But no veterinary surgeon should be appointed to the service until his qualifications have been determined by an examining board composed of at least one army veterinary surgeon, an army surgeon, and an officer of the Quartermaster's Department. A certain standard of proficiency should be required, as obtains in the Medical Department, and then a three months' probation under the chief veterinary surgeon before assignment to independent duty. This would not only determine the candidate's practical acquaintance with diseases, but introduce him to the other duties of his position.

Such an organization is not only possible, but demanded by the best interests of the service.

REPORTS OF CASES.

ENLARGEMENT OF THE SPLEEN.

BY R. HARRISON, D.V.S.

This subject was a gray gelding, sixteen years old and about fifteen hands high, used for a number of years in a hack. Had always worked well until the beginning of the present summer, when his appetite became capricious, until he could scarcely eat at all. Thinking a change would do him good, he was taken into the country, but could not be kept there, as he would invariably jump the fences and come home. He was kept for a time at the stable, doing but little work, until he became so feeble that he was sent to the scavenger's to be destroyed.

On making an incision along the median line, about two gallons of dark, serous fluid escaped, and a large black mass was noticed on the left side. This being unusual they sent for me, as I had asked them to let me know when they saw anything that was out of the common run.

The large black mass referred to was the spleen, enlarged to an enormous extent and weighing 56 pounds. Its length was 43 inches, breadth $20\frac{1}{2}$, circumference 9 feet and 2 inches, and 9

inches in its thickest part and 3 in its thinnest. On section the splenic tissue seemed everywhere destroyed, and in its place were melanotic deposits; its structure was firm, but at the same time readily cut.

The lungs were slate colored, and the heart, together with its large vessels, had melanoid infiltration. The stomach was very small, being pressed upon by the large spleen.

The coats of the large abdominal vessels showed deposits throughout. The liver, pancreas, kidneys, and mesenteric glands were involved and softened.

A peculiarity of this case was that the animal was reported blind for some time previous, and on post mortem examination small granular deposits were found over the choroid coat and over the place where the optic nerve enters the globe.

PIERCED EYE.

BY J. P. KLENCH, V.S.

A short time ago I happened to see in an old number of the New York *Spirit of the Times* of 1878 an item reading thus: "H. E, Mount Pleasant.—We are afraid that the membrane containing the vitreous humor, or corpus vitreum, has been burst, and the escape of the fluid causes the collapse of the tissue, which accounts for the injured organ becoming smaller than its fellow on the opposite side. This substance (the vitreous humor) is a transparent, gelatinous substance, which fills the back part of the eye, behind the crystalline lens, or probably the aqueous humor, which is a colorless fluid, situated in the anterior and posterior chambers of the eye, has been permitted to escape; *in either case a cure would be impossible*. We are almost satisfied either one or both of those fluids have escaped."

At the same time that this item came under my observation, I had under treatment a case exactly similar to the one above mentioned. It was that of a horse that got, as the proprietor termed it, a sore eye over night, he did not know how. On examination I found the eyelids firmly closed, the eyeball fallen in,

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and the vitreous fluid falling down in a flow as thick as a lead pencil and filling entirely the opening made in the eye. The pupil was intact, semi-opaque, lifeless; the conjunctiva was sunk all around the pupil. The opening was of a triangular form, located a little above and behind the pupil, and leading into the posterior cavity of the eye. It was proven that the horse had been injured by a pitchfork the evening before, after dark.

This is the second case that I found in my practice where the eyeball was burst; with my first patient the treatment was very successful, and, as I was called very soon after this accident had happened, I felt confident of succeeding as well in this case. A wet cushion was applied over the eye; the horse was gently physicked, put at half diet and kept quiet in a dark place until the fourth day, when I called again to see him, and found that the eye had refilled and regained its former natural size. The wet cushion was continued for another week, and a collyrium composed of calomel, extract of belladonna, tincture of aloes and rose water was introduced twice a day in the eye with a feather. At the end of that time the eyesight was entirely restored. A clear cicatrix of a triangular shape, in white lines with a blueish shading around it, extended even to that portion of the conjunctiva which covers the pupil. The horse was sent to work and all treatment ceased.

Considering the excellent success I attained in these two cases, I think I have a right to disagree with the eminent veterinary editor of the *Spirit of the Times* when he declares such cases to be hopeless and always fatal. I firmly believe that whenever the eyeball is pierced in either the anterior or posterior cavity, and when the horse is given perfect rest and subjected to a proper treatment immediately, there is every prospect of a favorable issue, unless some important organ, like the retina and crystallized lens with its capsule, had been injured.

SALIVARY CALCULI.

BY THE SAME.

It is a very common occurrence to find salivary calculi in horses in the San Joaquin Valley. These concretions, varying in

size from that of an almond to that of an apricot, are all found on the left side, as far as my observation goes, which would seem to be due to the circumstance that the horses generally masticate their feed more on the left row of grinders than on the right one.

The centre of all these calculi appears to be either of wild oats or barley. The feed used around Stockton for horses is crushed barley and hay, which latter is either barley, summer-fallowed wheat or wild oats. This hay is generally full of grain. Now, it can be easily understood that during the act of mastication some hay is pressed between the grinders and the cheek, and thus a grain is likely to enter one of the numerous little glandular ducts lining the molar teeth, and there forming the nucleus of a salivary calculus.

Now, I wish to call the attention of my colleagues to the location of these concretions. My first impression on seeing them was that they were primitively formed in the Stenian duct; besides, I never heard or read of the possibility of calculi forming outside of the ducts of the parotid and maxillary glands, so I was in doubt for some time as to which those I saw really belonged to. But after close examination I came to the opinion that they were connected with the superior molar glands. They were all located one inch ahead of the Stenian duct, opposite the second superior molar tooth, easily movable in all directions between the buccal membrane and the alveolo-labial muscle, without causing any pain or disturbance except in some cases, where the concretion had such large dimensions as to push the membrane between the teeth during the act of mastication. Besides, I never did find any sign of inflammation of late or ancient date; nor have I learned through careful inquiries of such farmers as owned horses bearing a salivary calculus that there ever was any swelling noticed around the head, which convinced me that there never was any change in the size or appearance of the parotid gland or its duct. Another circumstance worthy of notice is that the wounds caused by the extraction of these calculi healed all up in a very short time without ending in a salivary fistula, which would be very often the case if they were found in the Stenian duct. My only purpose in publishing these remarks was to call the atten-

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tion of the readers of the *REVIEW* to the possibility of salivary calculi forming in the molar glands.

Before closing I must add that this very manner of feeding grained hay causes a good many salivary fistulæ, which all cure in a short time by an injection of *liquer de Villate*.

SOCIETY MEETINGS.

The regular monthly meeting of the New York State Veterinary Society was held at the American Veterinary College, on October 10th, 1882.

In the absence of the President, the Secretary called the meeting to order, and the Vice President, Dr. Burden, was called to the chair. After the calling of the roll and the reading of the minutes of the previous meeting, the essayist, Dr. Coates, presented the following paper on "*Septicæmia and Pyæmia*."

Mr. President and Gentlemen:

According to the request of the President of the New York State Veterinary Society, to write an essay on some topic which will be of interest to the profession, and at the same time to excite a discussion among the members of this Society, I have chosen a subject from which I hope to hear the different views and opinions of the gentlemen here assembled freely expressed, as it is a matter which requires attention not only on account of its pathology, but the manner and mode of its production. Some diseases are interesting on account of their frequency, others because of their rarity, while pyæmia and septicæmia are on account of the diversity of opinion as to their pathology, etiology and symptomatology, and I have written as concisely as possible the most prominent features of these diseases. Pyæmia is a specific infectious disease, acting the same way every time—a morbid condition of the blood, which is produced by a miasm generated in decomposing pus, giving rise to recurrent chills, fevers and sweats, and characterized after death by metastatic abscesses; while septicæmia is a morbid condition of the blood dependent

upon absorption of decomposing animal matter by the lymphatics, when placed in actual contact with a living membrane arising from the absorption of septic matter, from gangrene, gangrenous wounds, lungs, pleura, &c., also the result of contaminated drinking water, (animalcules), water containing putrid or septic matter from dead animals, &c. Pyæmia arises from the poison developed from putrifying pus, either inside or outside of the body, as phlebitis, suppurative phlebitis, from atmospheric influences producing changes in the blood, and from thrombus and emboli. The blood, as a result of the miasmatic infection, exhibits a tendency to coagulate spontaneously in the veins, and especially where the current of blood is slowed, as in the capillary vessels. The blood coagulates spontaneously in the veins, and decomposes rapidly after being drawn from the body. In various organs in the body there will be infractions, which result in abscesses due to the presence of the poison; the mucous membranes of the body will be found thickened, clot in the heart with fibrous strings interlacing the chordæ tendinæ. In septicæmia the blood loses its power of coagulation, becomes darker in color, and serum of a dark yellow color; spleen enlarges and softens; congestion of mucous membrane of intestines, with catarrh of the digestive tract; molecular degeneration of the heart, which weakens it; congestion and œdema of the lungs, due to the failure of the heart power; congestion and œdema of the liver; spleen and mucous membranes softened. In septicæmia the septic matter is absorbed by the lymphatics, in pyæmia by the veins, and takes place in the following manner: as, for example, a wound of the foot setting up an inflammation of the veins, a thrombus is formed, which breaks up, and carried through the veins into the heart, the embolus passes from the heart through the arterial circulation of the lungs till it stops in a branch too small for its passage. Now congestion of the capillaries takes place, due to the collateral circulation, then œdema and inflammation, which take on a suppurative process due to the character of the poison; the same take place in other organs, and these infractions may again break down, and carried through the circulation to other parts of the body, form other abscesses.

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Symptoms of septicæmia are according to the amount of poison absorbed. In the severe type there is a chill and sudden fever, with rapid rise of temperature, which is 102° F., or may go as high as 105 or 106° F. There is only one chill, or it may be a slight rigor, with rise of temperature. In the first forty-eight hours they become restless, pulse weak and from fifty to eighty, or even higher; respiration increased; diarrhœa in some cases, and offensive; then pass into a comatose condition and die. Skin is generally dry, but may have profuse perspiration and bad smell from animal. Generally die in seventy-two hours, but if live a week or ten days are likely to recover, and perfectly. In pyæmia, the symptoms are usually well marked; at first there is a rise of temperature 104 or 105° F., then a chill which lasts some time but may take place at the time of the rise of the temperature, or a short time after, then perspires freely, after which time the temperature lowers a little, or in some cases it may have a marked rise. They now become restless and exhausted, then the symptoms abate and recur again with chill and sweat more profusely; pulse is rapid, weak and compressible; before each chill the animal is restless, after the sweat the patient becomes more composed. As the inflections occur in the different organs, will have symptoms belonging to these organs affected as local manifestations of the disease. Pyæmia differs from septicæmia by the recurrence of the chills and sweating and a peculiar yellowishness of the conjunctivæ, and sometimes of the other visible mucous membranes.

The only question of importance that arose during the ensuing discussion, was whether or not a septic disease has an incubative stage. There was considerable diversity of opinion on this point, some of the members asserting that there can be no incubative stage to a septic disease, as the disease begins its development immediately and presents symptoms immediately, while others held that the poison could lie latent for a variable period and no constitutional symptoms would be manifested, and considered this the incubative stage.

A vote of thanks was unanimously extended to the essayist for his paper.

Dr. Crane was appointed as essayist for the next meeting, which will be held at the American Veterinary College, on Tuesday evening, November 14th. The Society then adjourned.

CORRESPONDENCE.

A GOOD SUGGESTION FOR A GOOD PURPOSE.

MALONE, N. Y.

Mr. Editor :

IN AMERICAN VETERINARY REVIEW, Vol. VI, No. 4, page 183, is a correspondence from E. Mink, of Rochester, N. Y., on the regulation of practice of veterinary medicine and surgery in this State. I hope the United States Veterinary Medical Association will instruct all its members present to do all in their power to have a bill passed. E. Mink has reference to have it passed the next term of the Legislature. I am not a graduate of any medical school, but have been practicing veterinary medicine for fifteen years, and should the bill become a law, I willingly will give up the practice if I cannot pass the examination required.

I think this is the most important item to be looked to, and each member should do his utmost with any members of our legislative body in a fair and honorable way. Our member of Assembly from Franklin county I have seen, and he will do all in his power to pass some reasonable bill to protect the veterinary practice in this State.

Yours, etc.,

G. H. KIDNEY, V. S.

REVIEW.

BOVINE MEDICINE AND SURGERY.

Every practitioner and student of veterinary medicine will receive with pleasure the notice of the publication of Prof. J. W. Hill's work on "Bovine Medicine and Surgery," which Mr. Jenkins, of New York, offers to-day to his patrons—a work which

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has been looked for for a long time, and one which will be read with pleasure by all interested.

Any veterinarian who will engage in the difficult task of enriching English veterinary literature will deserve credit for his endeavors, especially in our days, when so few writers are to be found, and Prof. Hill will allow us to express to him our sincere compliments for his new work. Handsomely printed, illustrated by 153 wood-cuts and 19 colored plates, "Bovine Medicine and Surgery" forms a large octavo volume of over 650 pages, the contents being divided into twenty-six chapters. The first ten chapters are essentially devoted to internal pathology of respiratory, circulatory, digestive, urinary and genital apparatus. They are followed by seven chapters upon the anatomy and physiology of the generative organs of the cow, parturition, diseases of foetus, monstrosities, diseases of the young animal, and those connected with parturition. The nervous system and the various senses occupy the four chapters following. Internal parasites and blood diseases are then described. The balance of the work contains a chapter upon surgery, another upon poisons and their antidotes; the last treats of diseased meat and milk.

As a whole, "Bovine Medicine and Surgery" will prove to every reader a good work, and one which every one will have in his library; and though the author remarks in the preface his object has not been to make every man his own doctor, there is no doubt that many non-professionals will do more than diagnose diseases by a careful perusal of the book. We regret that Prof. Hill has not been more generous in giving the public some of the new theories and facts, which are to-day pretty well admitted by veterinarians, upon two important diseases of cattle, viz.: anthrax and phthisis pulmonalis. It is true that the readers of English veterinary journals may have, through them, learned of the discoveries of Pasteur, Toussaint, Koch and others; still, we believe in a work like this, notice of those discoveries would not have been out of place. It is a vacuum in this excellent work which we are sorry to notice.

The work is well written, enlarged in many instances with unnecessary descriptions, though in others perhaps a little too

concise. Still, we feel well satisfied that it will prove a good acquisition to veterinary literature, and that dedicated as it is to our esteemed friend, George Fleming, it will meet with the good success it deserves.

NEWS AND SUNDRIES.

HARVARD VETERINARY DEPARTMENT.—Students in veterinary medicine at Harvard College will be received on and after September 26th.

STRANGE DISEASE.—A disease, said to be a combination of black measles and scarlet fever, is raging at Sitka, Alaska. What next?

WHITE DEER.—A deer, milk-white in color, was received from Maine recently by one of the dealers in Quincy Market, Boston. It is said to be the first albino of that species of animal ever received there.

CATTLE QUARANTINE.—The Cattle Quarantine Commissioners find a difficulty in securing proper ground for their stations at the principle ports. They have written to the trunk lines of railroad asking their suggestion as to sites.—*American Cultivator*.

AID TO SCIENTIFIC RESEARCH.—M. Pasteur has received for prosecuting his scientific researches in regard to the contagious diseases of animals grants of money amounting altogether to \$30,000.—*American Farmer*.

LARGE COLT.—Col. Holloway has a two-year-old Clydesdale stallion, Baily Williams, weighing, in only moderate flesh, over 1,800 lbs. He is by the great Druid, and out of a Prince of Wales mare. He promises to rival his renowned sire in size. Druid's weight was about 2,500 lbs.—*National Live Stock Journal*.

HYDROPHOBIA AND DOG-MUZZLES.—In Bordeaux, between 1876-78, when dogs were muzzled, there were 5 mad dogs which bit 52 other dogs, one cat, and one man. Between 1871-81,

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when muzzles were removed, there were 32 dogs which bit 209 animals and four persons. The value of muzzling the dogs is clearly shown.—*Medical Record*.

SWINE PLAGUE.—The swine disease, which has carried away many animals in the neighborhood of Reading, Pa., has caused great alarm. All the remedies applied have failed to affect a cure so far, and no doubt the best mode and cheapest remedy with the animals attacked is to kill them at once and bury them deeply out of sight to prevent contagion.—*American Cultivator*.

AID TO AGRICULTURE.—Little Belgium pays \$22,000 for the advancement of agriculture; the objects are: For indemnity for diseased animals (killed by order of the Government), veterinary service and aid to widows and orphans of former veterinary physicians, improvements of races of domestic animals, agricultural exhibitions and other encouragements, agricultural, horticultural and veterinary schools.—*Farmer's Review*.

HORSES FOR FOOD.—During the last six months 3,085 horses have been used for food in Berlin. The warm sausages sold in the streets at night are mostly of equine origin. When a prominent restaurant keeper failed some years ago the most conspicuous among his creditors was a horse-butcher, which throws a side light on the "roast beef" that used to be served up to his guests. The poor are the chief buyers, but there are not a few gourmands who look upon horse flesh as a delicacy.—*American Cultivator*.

THE PASTEUR PROCESS SUCCESSFUL IN WARM CLIMATES.—The Pasteur process of vaccinating sheep as preventive against *charbon*, after proving a success in the North of France, has turned out the same in the warm South. The point on which attention is now fixed is, for how long—6, 12, or 36 months—does the efficacy of the poek endure? Time, of course, will settle the point. Native Barbary sheep are proverbially known to resist *charbon*, but when crossed in France, that immunity disappears.—*Farmer's Review*.

LIVE STOCK ESTIMATES.—The United States has 38,000,000 cattle, India 30,000,000, and Russia 29,000,000. Of horses,

Russia 20,000,000, the United States 10,500,000, and Austria 3,500,000. Australia possesses 80,000,000 sheep, the Argentine Republic 68,000,000, and Russia 63,000,000. The United States comes fourth in the list here with 36,000,000, but then she leads the world on swine, having 48,000,000. It is not generally known that the goat is an important live stock integer in some countries. India is credited with 20,000,000, Africa with 15,000,000, and Mexico with 6,000,000. Thus the United States stands first in the list of nations on the two most important articles of flesh food, cattle and hogs, second in horses and fourth in sheep. The next decade will probably find us first also in horses, and, perhaps, third in the number of sheep.

SLAUGHTER-HOUSE EXAMINATIONS.—The importance of facts to be obtained by a careful and systematic examination of animals slaughtered for food has hardly been recognized in this country. Reports of such examinations made in other countries have frequently been found to contain most valuable information. In particular, the city of Augsburg may be instanced. For some years the investigations of Inspector Adam have been widely quoted by Fleming and others. Recently the *Journal of Comparative Medicine* gives some important data obtained from the same source. Among 66,731 animals brought to market in the year 1881, there were 12,269 cattle, of which 246, or 2.01 per cent., were found tuberculous. This ratio is much smaller than is generally supposed to exist among American cattle. But further, the amount of tuberculosis varied greatly, and in most cases was not extensive enough to injure seriously the quality of the meat. In fact, only eighteen animals out of the two hundred and forty-six were condemned as unfit for food. The tubercles were confined to the lung in 142 cases, to the pleura in 37 cases, to the lungs and pleura in 68 cases. In 59 cases there were also tubercles in the liver.

Thus the important fact is brought out that in no cases were tubercles found in parts of the body (except the liver) used as food.

Further facts bearing upon the infectiousness of the milk of tuberculous cows are given. Among 24,901 calves killed, when

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under the age of four weeks, no tubercles were found. Now, about five hundred of these must have been sucking the milk of tuberculous mothers, yet with apparently no injurious effect. And furthermore, the age of the tuberculous cattle was, with the exception of twenty-three, over three years. The conclusion is, that cattle, at least, are not infected in the ordinary sense with tuberculosis by feeding upon the milk from diseased mothers.—*Medical Record*.

EXCHANGES, ETC., RECEIVED.

FOREIGN.—Revue für Thierheilkunde und Thierzucht, Veterinary Journal, Veterinarian, Clinica Veterinaria, Review d'Hygiene, Archives Veterinaires, Recueil de Medecine Veterinaire, Journal de Zoötechnie, Gazette Medicale, Annales de Belgique.

HOME.—Turf, Field and Farm, Rural New Yorker, Ohio Farmer, Practical Farmer, Farmers' Review, American Agriculturist, American Cultivator, Breeders' Gazette, National Live Stock Journal, New York Weekly Times, Country Gentlemen, Medical and Surgical Reporter, Medical Record, City and Country, Iowa Farmer.

JOURNALS.—New England Homestead, Home Farm, Farm Journal, Western Medical Reporter, Boston Daily Advertiser, Spirit of the Turf, American Field.

BOOKS.—Animal Plagues, second part.

COMMUNICATIONS.—R. Harrison, A. A. Holcombe, J. P. Klench, H. T. Foote.